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Date: 11/25/2019 11:51:56 AM
Subject: Input on Arkema status (if possible) - deliberative email releasable attachments
Attachments: [Arkema GWET Info.pdf](#)
[Arkema SW Info.pdf](#)

Hi Dave,

There is a call between EPA and the Yakama Nation Tuesday 11/26 at 10:30. The YN wants to get an update on the in-water conceptual site model and a general update on work performed to date. We were hoping (if time allows) to get your validation on the Arkema status. Before Matt^{(b) (6)} he provided the message to Sean copied below regarding the Arkema CSM which I find very insightful. We were wondering if this anything substantive has changed from your perspective? We also had the following questions on the GWET and SW systems. FYI, we are planning to use the attached figures as talking points during the call.

GWET:

DEQ's 5/31/19 comment letter on the September 2018 Draft GWET System Effectiveness Evaluation notes that migration of contamination around and possibly under the wall is an ongoing concern given the lack of hydraulic control. Your TCT updates in Oct/Nov indicate LSS has finished well rehabilitation, performed some geophysical work may be considering a horizontal well. Is there still a concern with mounding behind the wall or are they getting closer to demonstrating capture?

SW treatment system:

Things seemed to be going well with stormwater as of EPA's review of the June 2018 PMR. Is that still the case (I don't recall seeing the 2019 PMR)?

Here is Matt's CSM message to Sean:

Following up on our post Arkema meeting discussion, I mentioned that I would pass along issues that will be important for you to track during potential upcoming negotiations and project design.

- There is a significant stranded wedge of source material, in the Acid Plant area, riverward of the groundwater containment soil/slurry wall that will not be removed during dredging. The in-water design needs to account for this. Fred and I were discussing it on the way to the elevators after the meeting. In this regard, the Arkema situation is very similar to Gasco, and there needs to be close coordination so the upland and in-water remedies work together.
- The CSM and distribution of PCDD/PCDFs and DDX in river sediment are different. For PCDD/PCDFs, the highest sediment concentrations are found at the sediment surface while the DDX concentrations are highest at depth. Because the PCDD/PCDF surface data is limited to the area between the docks, the downstream extent in surface sediment is uncertain. Data from subsurface samples from cores downstream of the docks (e.g., WB66) indicate that elevated PCDD/PCDF extend downstream of the docks. Additional characterization during design is needed to delineate RAL exceedances.
- The dredge fill upland on Lots 1 and 2 contain low levels of DDX similar to the off-shore sediment. Groundwater monitoring data in this area, outside of the influence of the Lot 3 and 4 groundwater containment system, has detectable DDX. The near shore technology assignments identify dredge only in portions of the downstream

- area. It can be reasonably argued that the dredge only area is within a groundwater plume discharge area requiring the consideration of the need for a post dredge cap. A post dredge cap would address flux from DDX impacted sediment below the dredge depth and the incremental additional upland groundwater flux. The DEQ upland FS will also evaluate an in-water cap as a remedial alternative in this area. Again, this is an area where the upland/in-water remedies need to coordinate.
- There is a significant chloroform plume upland that discharges to the Willamette River along the downstream edge of the groundwater containment system. There also appears to be a chloroform source in the riverbank between the downstream docks riverward of the barrier wall. Chloroform is not a Table 17 COC. The upland remedy will require remediation of the plume along the downstream edge of the hydraulic containment system. While DEQ can assert regulatory authority on the chloroform in the riverbank it is not easily separated from the in-water remedy. Ideally, the sediment cap design in both areas accounts for the chloroform flux. Additional coordination is necessary to incorporate DEQ upland remedial requirements into the in-water remedial design.
- Construction of the soil/slurry groundwater barrier wall bifurcated the groundwater plumes. Plumes on the riverside of the barrier wall are to be addressed either by MNA or augmented sediment caps. Of particular concern is the perchlorate plume that is not readily managed by traditional cap designs. Pre barrier wall TZW perchlorate concentrations were up to 360,000 ug/L. The Table 17 CUL for perchlorate in groundwater is 15 ug /L. It is important that early design data determine if there has been any substantial attenuation of the detached plume. If not, a review of remedial options should be required.

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